

REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1, 2, 4, 5, 7, 8, 12, 13, 14, 17, 18, 20-23, 27, 30, 31, 35 and 36 have been amended. Claims 11, 24-26 and 34 have been withdrawn. Claims 1-10, 12-23, 27-33, 35 and 36 are pending and under consideration.

CLAIM REJECTIONS – 35 U.S.C § 112

Claims 1-10, 12-23, 27-33 and 35-36 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Appropriate correction has been made to claims 1, 2, 4, 5, 7, 8, 12, 13, 14, 17, 18, 20-23, 27, 30, 31, 35 and 36 in order overcome the rejection under 35 U.S.C. 112, second paragraph.

Withdrawal of the foregoing rejection is requested.

CLAIM REJECTIONS – 35 U.S.C. § 102

Claims 1, 7, 12-16, 18, 19, 27-29, and 36 were rejected under 35 U.S.C. 102(b) as being anticipated by Gustafson et al. (U.S. Patent No. 6,382,619) (hereinafter “Gustafson”).

Gustafson discloses a pick mechanism and image forming device including the same. The exemplary printer 10 includes a second, relatively large capacity lower tray 24 for a sheet stack 26. A printer base 28 separates the lower tray 24 from the remainder of the printer 10. A pick mechanism 30 is used to advance the top sheet 32 of the sheet stack 26 into an angled separator wall 34. The top sheet 32 will buckle, separate from the rest of the sheet stack 26, and advance along a curved deflector 36 to the pick roller 16. From there, the sheet is advanced to the image forming region and then onto the output tray. The upper sheet stack 12 will be out of engagement with the pick roller 16 when sheets are being picked from the sheet stack 26. Gustafson, 3:39 – 3:53.

The exemplary pick mechanism 30 includes a pick arm 38 that is supported on a rotating drive shaft 40. The drive shaft 40 is supported on a spring hub 42, which acts as a bushing, and a bushing 44. Spring hub 42 is supported on a transmission chassis 46, while bushing 44 is supported on the printer chassis. The drive shaft 40 also supports drive shaft gears 48 and 50. Drive shaft gear 48 is driven by a transmission system 52 to rotate the drive shaft 40, while drive

shaft gear 50 drives a series of pick arm idler gears 54a, 54b, 54c and 54d. The pick arm idler gear 54d drives a pick roller gear 56 to rotate a pick roller 58. The pick arm idler gears 54a-54d, pick roller gear 56 and pick roller 58 are secured between a pick arm frame 60 and a pick arm cover 62 to form the pick arm 38. Gustafson, 3:61 – 4:9.

The pick arm 38 is biased to, and maintained in, an idle position where the pick roller 58 is out of contact with the top sheet in the stack 26 by a counter balance spring 64. The counter balance spring 64 includes a central portion 66, which is supported on a spring hub 68 that is integral with the pick arm cover 62, a first spring arm 70 that engages the underside of the printer base 28, and a second spring arm that engages the pick arm 38. Other methods of biasing the pick arm 38, such as a counter weight, solenoid, elastic band, coil spring or leaf spring, may also be employed. Gustafson, 4:16 – 4:27.

The force of the counter balance spring 68 may be overcome, and the pick arm 38 driven to a pick position where the pick roller 58 engages the top sheet in the stack 26, by a pick mechanism actuation system 72. The actuation system 72 applies force to the pick arm 38 to drive it to the pick position only at the appropriate time. The force applied by the actuation system 72 will be maximized when the tray 24 is full and the angle between the pick arm 38 and the stack 26 is at its smallest and minimized when the tray is close to empty and the angle between the pick arm and the stack is at its greatest. Gustafson, 4:28 – 4:39.

Reducing the magnitude of the normal force added to the pick roller from a maximum when the tray is full to a minimum when the tray is almost empty allows the pick roller to both frictionally engage the top sheet in a full relatively large tray and function properly when the tray is close to empty. Moreover, because the additional force is only applied during the pick process, deformation (or "creep") of the pick arm and related parts will be minimized. Gustafson, 4:41 – 4:49.

Claims 1-10 and 36

Amended independent claims 1, 7 and 36 recite: "...a pick-up position varying unit to move the pick-up roller to one position among at least two pick-up positions, wherein the pick-up positions which are pre-set in accordance with characteristics of the sheets of paper characteristics." In contrast to amended claims 1, 7 and 36, Gustafson discloses a pick mechanism actuation system that applies force to the pick arm to drive it to the pick position only at the appropriate time. The force applied by the actuation system will be maximized when the

tray is full and the angle between the pick arm and the stack is at its smallest and minimized when the tray is close to empty and the angle between the pick arm and the stack is at its greatest. Amended claims 1, 7 and 36 recite a pick-up position varying unit to move the pick-up roller to a position among at least two pick-up positions in accordance with characteristics of the sheets of paper. The actuation system in Gustafson operates based on the height of papers in the stack, the pick-up position varying unit in amended claims 1, 7 and 36 operates based on characteristics of the sheets of paper.

Claims 2-6 are dependent on claim 1 and are therefore believed to be allowable for the foregoing reasons. Claims 8-10 are dependent on claim 7 and are therefore believed to be allowable for the foregoing reasons.

Withdrawal of the foregoing rejections is requested.

Claims 12-23, 27-33 and 35

Amended independent claims 12 and 27 recite: "...a pickup position varying unit to move the pickup roller to pickup positions, wherein the pickup positions are pre-set in accordance with characteristics of the ~~fed~~papers in the stack." In contrast to amended claims 12 and 27, Gustafson discloses a pick mechanism actuation system that applies force to the pick arm to drive it to the pick position only at the appropriate time. The force applied by the actuation system will be maximized when the tray is full and the angle between the pick arm and the stack is at its smallest and minimized when the tray is close to empty and the angle between the pick arm and the stack is at its greatest. Amended claims 12 and 27 recite a pick-up position varying unit to move the pick-up roller to a position among at least two pick-up positions in accordance with characteristics of the sheets of paper. The actuation system in Gustafson operates based on the height of papers in the stack, the pick-up position varying unit in amended claims 12 and 27 operates based on characteristics of the sheets of paper.

Claims 13-23 are dependent on claim 12 and are therefore believed to be allowable for the foregoing reasons. Claims 28-33 and 35 are dependent on claim 27 and are therefore believed to be allowable for the foregoing reasons.

Withdrawal of the foregoing rejections is requested.

CLAIM REJECTIONS – 35 U.S.C. § 102

Claims 1, 2, 7-9, 12-17, 21, 27, 28, 30 and 36 were rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication No. 57-27838.

Japanese Patent Publication No. 57-27838 discloses a paper feeder for preventing a sheet of paper from being folded in a feeder device for supplying papers sheet by sheet with rotating motion of a paper feed roller from the uppermost sheet of an accumulated paper layer, by adjusting the space between the paper feed roller and separator pawl in accordance with a kind of paper. Japanese Patent Publication No. 57-27838, English Abstract.

The paper feeder includes a shaft 7 fixed to the upper end of an arm 5. A worm wheel 11, meshed to a worm gear 13 directly coupled to a motor 12, is fixed to the shaft 7. An arm 6 is connected to the lower end of the arm 5 by a shaft 4 and turned about the shaft 4 by the action of a solenoid 15 through a link 16 and extension part 14. To transmit rotating motion to a paper feed roller 2, a gear 18 is mounted to a shaft 17 of said roller 2, then rotation of a motor driven gear 24 is transmitted through gears. Then in accordance with a kind of paper the motor 12 is actuated to rotate the arm 5 at a prescribed angle, thus distance between a separator pawl 3 and the paper feed roller 2 can be adjusted. Japanese Patent Publication No. 57-27838, English Abstract.

Claims 1-2, 7-9 and 36

Amended independent claims 1, 7 and 36 recite: "...the paper feeding cassette having a friction resistance plate, inclined by a predetermined angle to come into contact with a leading end of the paper sheet, to separate the paper sheets one by one..." In contrast to amended claims 1, 7 and 36, Japanese Patent Publication No. 57-27838 discloses a separator pawl 3 that is not inclined at a predetermined angle.

Claims 2 is dependent on claim 1 and are therefore believed to be allowable for the foregoing reasons. Claims 8 and 9 are dependent on claim 7 and are therefore believed to be allowable for the foregoing reasons.

Withdrawal of the foregoing rejections is requested.

Claims 12-17, 21, 27, 28 and 30

Amended independent claims 12 and 27 recite: "...a friction resistance plate inclined by a predetermined angle..." In contrast to amended claims 12 and 27, Japanese Patent Publication No. 57-27838 discloses a separator pawl 3 that is not inclined at a predetermined angle.

Claims 13-17 and 21 are dependent on claim 12 and are therefore believed to be allowable for the foregoing reasons. Claims 28 and 30 are dependent on claim 27 and are therefore believed to be allowable for the foregoing reasons.

Withdrawal of the foregoing rejections is requested.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.


Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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